

Amendments to the Drawings

The attached sheets of drawings include changes to Fig. 4. These sheets replace the original sheets of drawings.

Attachment: Four replacement sheets

Remarks

Applicants respectfully request reconsideration of the present application in view of the foregoing amendments and the following remarks. Claims 1-17 are pending in the application. Claims 1-17 are rejected. No claims have been allowed. Claims 1, 10, and 13 are independent. Claims 1, 5, and 14 have been amended to clarify claim language. No new matter has been added.

Cited Art

The Action cites U.S. Pat. No. 6,560,720 to Chirashnya et al. ("Chirashnya"); U.S. Pat. No. 7,013,482 to Krumel ("Krumel"); Kim et al., "Design and Implementation of Home Network Systems Using UPnP Middleware for Networked Appliances", IEEE Transactions on Consumer Electronics, Volume 48, Issue 4, Nov 2002, pages 963-972 ("Kim"); Dugan et al "Design of Interfaces for Power Systems Analysis Components", Power Engineering Society Summer Meeting, Volume 2, 18-22, Pages 852-857, July 1999 ("Dugan").

Informalities in the Specification

The Action objects to the disclosure, pointing to various alleged informalities in the specification. With respect to the "hyperlinks" on pages 1, 5, and 12, Applicants note that inclusion of the hyperlinks was not intended as incorporation by reference. In order to expedite examination, however, Applicants have amended the specification to remove reference to these hyperlinks.

With respect to the typographical errors of pages 14 and 17, Applicants have amended the specification to correct these errors. No new matter is added by these amendments.

Claim Rejections - 35 USC § 112

The Action rejects claims 1-9 and 14 under 35 USC § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The Action rejects claim 1 for not specifying “what happens when the action request does not match an action out of the set of actions specified in the description.” [Action, at page 4, para. 13.] Applicants have hence amended claim 1 to recite:

in response to receiving an action request per the device connectivity protocol, validating to which action out of the set of actions specified in the description the action request matches;
upon validating an action to which the action request matches, performing a default behavior consistent with the description.

Applicants believe that the amended claim language addresses the rejection and is not indefinite and thus satisfies 35 USC § 112.

The Action also rejects claim 14 for not specifying “what happens when the user-provided action behavior is not hooked for action,” respectively. [Action, at page 5, para. 16.] However, Applicants respectfully disagree with the judgment of the Action that this language is indefinite. In particular, Applicants note that claim 13, from which claim 14 depends, recites:

program code for performing a default behavior producing a response for the action consistent with the data format specified in the description.

Claim 13 is then amended by claim 14 to *also* recite the language at question in the rejection, namely:

program code operating in a case that a user-provided action behavior implementation is presently hooked for the action to invoke the user-provided action behavior implementation in place of the default behavior.

Applicants note then that claim 13 already provides language reciting program code for performing a default behavior in response to the action, while claim 14 adds language reciting program code which invokes “user-provided action behavior” *instead of the default behavior in the case that the user-provided action behavior is hooked*. Thus, in the case that the user-provided action behavior is not hooked, the default behavior, already recited in claim 13, would be performed. Thus, Applicants believe that the claim language in its current condition is not indefinite and satisfies 35 USC § 112.

The Action additionally rejects claim 5 alleging that the original language “of some number fewer than all of the set of actions” is a relative term that renders the claim indefinite. Applicants have amended the claim to read “of at least one action out of the set of actions but not every action out of the set of actions.” The Action also rejects claim 14 alleging that the original language “any number of the set of actions” is a relative term that renders the claim indefinite.

Applicants have amended the claim to read “one or more actions out of the set of actions.” Applicants believe that the amended claim language addresses the rejections and thus the claims are not indefinite and thus satisfy 35 USC § 112.

Applicants believe that, through the amendments detailed above, claims 1, 5, and 14, satisfy the requirements of 35 USC § 112. Applicants request that the rejection of these claims under 35 USC § 112, as well as the rejection of dependent claims 2-4 and 6-9, be withdrawn.

Claims Rejections - 35 USC § 102

The Action rejects claims 1-5, 13-16 under 35 USC § 102(a) as being anticipated by Kim. For a 102(a) rejection to be proper, the cited art must show each and every element as set forth in a claim. (See MPEP § 2131.01.) However, the cited art does not describe each and every element. Accordingly, applicants request that the rejection be withdrawn.

Claim 1

Claim 1 recites, in part:

processing a description of a device to be emulated in the device connectivity protocol, the description specifying a set of actions of the device;
...
upon validating an action to which the action request matches, performing a default behavior consistent with the description.

For example, the Application, describes examples of device emulation:

The generic device emulator effectively provides an implementation of the emulated device as it would operate within the UPnP™ protocol. The emulated device can be any device that can operate in the UPnP™ architecture (i.e., any UPnP™ -compliant device). Alternative embodiments of the generic device emulator for other device connectivity or communication protocols can provide generic emulation of devices for such protocols.

The generic device emulator 210 emulates the behaviors of the emulated device within UPnP™ based on the UPnP™ description of the device Given the device and service descriptions 220-221 of any UPnP™ device, the generic device emulator 210 emulates behaviors implementing the description within UPnP™. . . .

In the control phase, the generic device emulator 210 implements default behaviors for the actions specified in the emulated device's service description document(s) 221. The generic device emulator 210 receives action invocation messages (SOAP commands) from control points and validates these messages against the emulated device's service description. Upon validation, the generic

device emulator 210 provides a default response to the action invocation, which response conforms to the data format and types specified in the service description for the action. For example, if the response to the action specified in the service description is to return an integer value, the default behavior simply returns a default integer value (e.g., a zero).

[Application, at page 13, line 2, to page 14, line 2.]

Kim's home server describes the traditional invocation of actions by devices, resulting in updated status variables, which does not teach or suggest "performing a default behavior consistent" with a "description of a device to be emulated" as recited in claim 1. In its rejection of this language of claim 1, the Action cites to page 965, column 1, para. 4 and Figure 2 of Kim. The cited portion, however, describes invocation of actions by appliances, not default behavior:

In the applicants section of the home server program display, simple information about each monitored appliance (the state variables) is displayed at the top. When the user invokes an action service using the action item in the device control frame, a message is sent to invoke the action. When successful, the updated state variables are displayed on the home server.

[Kim, at page 965, column 1, para. 4.] In this section, Kim makes clear that the action is being performed by an actual UPnP-compatible appliance, and is not performed in order to emulate a device. In particular, the cited portion of Kim describes "updated state variables" which indicate the changing of an appliance state. This teaches away from the performance of a "default behavior" which would not require state variables to update. Figure 2 likewise discusses updated variables in its "Action Invocation loop," which was also cited in the rejection of claim 1.

Furthermore, Kim's description of information about appliances which are currently attached to a home network system does not teach or suggest "a description of a device to be emulated" as recited in claim 1. At page 965, column 1, para. 2, cited in the Action in the rejection of this language of claim 1, Kim describes the discovery of UPnP-compatible appliances which are connected to a home network system:

When a UPnP-compatible appliance is found, a display icon of the appliance and its name appear in the tree view on the left side of the home server and home browser programs. The user receives information about the services and actions of the home appliance by double-clicking on the tree view. When an action service is invoked the information of the arguments of the appliances in operation is displayed.

Thus, as Kim describes, the information cited in the Action describes appliances which are currently connected to the home network system. Because this information is about appliances

which are currently attached, this information does not teach or suggest, and in fact teaches away from, “a description of a device to be emulated” which is recited in claim 1.

For at least these reasons, Kim cannot teach or suggest each and every element in claim 1. Thus, the rejection of claim 1 over Kim is improper. Applicants therefore request that the rejection of claim 1, and of dependent claims 2-5, be withdrawn and claims 1-5 be allowed.

Claim 13

Claim 13 recites, in part:

Computer-readable media having stored thereon a software framework of a generic device emulator for execution on a computer to provide emulation of an operation of a device within a device connectivity architecture consistent with a textual description of the device, . . . the generic device emulator comprising:

. . .

program code for performing a default behavior producing a response for the action consistent with the data format specified in the description.

In its rejection of the quoted language in claim 13, the Action cites to the same portions of Kim as were discussed above with respect to claim 1. Thus, for at least the reasons discussed above with respect to claim 1, Kim cannot teach or suggest each and every element in claim 13. The rejection of claim 13 over Kim is improper. Applicants therefore request that the rejection of claim 13, and of dependent claims 14-16, be withdrawn and claims 13-16 be allowed.

Claim Rejections - 35 USC § 103

The Action rejects claims 6-12 and 17 under 35 USC 103(a) as being unpatentable over a variety of references. In particular, the Action rejects independent claim 10 under 35 USC 103(a) as being unpatentable over Krumel, in view of Kim and Dugan. To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. (MPEP § 2142.)

Claim 10

Claim 10 recites:

A method of emulating devices in a device connectivity protocol, the method comprising:
reading a defect configuration representing in a tagged text format at least one defect behavior to be applied to a type of packet transmitted from an emulated device per the device connectivity protocol;
upon producing a packet of a type for which a defect behavior is represented in the defect configuration, applying the defect behavior to the packet; and
transmitting the packet as modified by applying the defect behavior.

For example, the Application describes the actions of a “defect callback handler:”

All the packets before being sent out on the socket are consulted with the Defect Callback Handler object 342. *The user can implement methods to inject a defect or defects into the packets. This feature is extremely useful in testing control points. Each method will inject a defect or defects into a particular message type. The user creates a defect behavior type by specifying a set of such methods using the defect configuration file 350. More information on specifying the defect types is detailed below. If no defect behavior is specified, the generic device emulator will emulate a perfect working device that is compliant with the UPnP™ Architecture 100.*

[Application, at page 18, lines 10-17; emphasis added.] A particular example of the usefulness of the addition of defects, as well as a type of defect, is shown at page 14, line 27 to page 15, line 4:

The generic device emulator 210 further provides a mechanism (described more fully below) for the vendor to define defective behaviors, which can be useful for testing control points 110-111 (Figure 1). The defective behaviors are defined using XML format statements in a textual configuration file, which describe defect filters to be applied to the messages generated by the generic device emulator for the emulated device. *For example, a defect filter can be defined to have the generic device emulator 210 strip off a leading ‘*’ character from headers of SOAP messages sent for the emulated device.*

[Emphasis added.]

Krumel’s filtering criteria are used for the removal of bad packets, and thus do not teach or describe “at least one defect behavior to be applied to a type of packet” which is then transmitted after “applying [of] the defect behavior to the packet[s]” as recited in claim 10. Krumel describes “[m]ethods and systems for firewall/data protection” which work by “filter[ing] data packets in real time.” [Krumel, at Abstract.] Krumel does this by applying various “filtering criteria” to packets:

If a packet of data fails to meet the filtering criteria, then it is not allowed to pass as a valid packet and is “junked.”

[Krumel, at column 4, line 66 to column 5, line 1.] Thus, Krumel's filtering criteria are used in order to locate and remove packets. Krumel emphasizes its use of this information in its use of the term "failed" to describe packets which satisfy the criteria:

In preferred embodiments, if any one or more of the performed filtering rules indicates that the packet should be failed (or not allowed to pass as a valid packet), then the output of aggregator 24 is a fail; otherwise, the packet is allowed and the output of aggregator 24 is a pass.

[Krumel, at column 6, lines 26-30.]

Thus, because Krumel's filtering criteria is directed toward the removal of packets, it teaches against the desirability of defining defects *to be applied* to packets. And therefore, it cannot teach or suggest "a defect configuration representing . . . at least one defect behavior to be applied to a type of packet" as well as "applying the defect behavior to the packet" and "transmitting the packet as modified by applying the defect behavior" as recited in claim 10. For at least these reasons, Krumel does not teach or suggest the above-quoted language of claim 10. Furthermore, Applicants do not find such disclosure in either Kim or Dugan. Thus, the rejection of claim 10 over Krumel in view of Kim and Dugan is improper. Applicants request that the rejection of claim 10 be withdrawn.

Applicants also request that the rejections of claims 11 and 12, each of which depend from claim 10, be withdrawn. Claim 11 is rejected over identical art as claim 10, and claim 12 is additionally rejected over Chirashnya, from which Applicants do not find additional disclosure for the above-quoted language of claim 10. Thus, Applicants request that claims 10-12 be allowed.

Finally, the Action rejects claims 6-9 and 17 under 35 USC 103(a) as being unpatentable over Kim et al as applied to claims 1 and 13, respectively, and further in view of Chirashnya (claims 6, 8, and 9), Chirashnya and Krumel (claim 7), or Krumel and Dugan (claim 17). Because Applicants do not find additional disclosure for the above-quoted language of claims 1 and 13 in either Chirashnya, Krumel, or Dugan, Applicants respectfully submit that, for at least the reasons discussed above with respect to claims 1 and 13, the rejections of claims 6-9 and 17 are improper. Applicants request that the rejections of claims 6-9 and 17 be withdrawn and that the claims be allowed.

Request For Interview

If any issues remain in light of these remarks and amendments, the Examiner is formally requested to contact the undersigned attorney to arrange a telephonic interview. It is believed that a brief discussion of the merits of the present application may expedite prosecution. Applicants submit the preceding formal Amendment and the above remarks so that the Examiner may fully evaluate Applicants' position, thereby enabling the interview to be more focused.

This request is being submitted under MPEP § 713.01, which indicates that an interview may be arranged in advance by a written request.

Conclusion

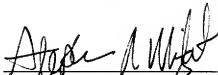
The claims in their present form should be allowable. Such action is respectfully requested.

Respectfully submitted,

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